Vol. 10. Part 8. Pp. 131–148. 15th August, 1941

THE PROCEEDINGS

OF THE

ROYAL ENTOMOLOGICAL SOCIETY OF LONDON

Series B.
TAXONOMY

(being the continuation of Stylops)

World List abbreviation: *Proc. R. ent. Soc. Lond.* (B)

CONTENTS

	PAGE
BENSON, Robert B., M.A., F.R.E.S. On some *Pontania* species, with a revision of the *proxima* and *herbaceae* groups (Hymenoptera Symphyta)	131–136, 4 figs.
CAMERON, Malcolm, M.B., R.N., F.R.E.S. Description of new STAPHYLINIDAE (Coleopt.)—3	142–147
FRASER, Lt.-Col. F. C., I.M.S. Retd., F.R.E.S. Notes on the genus *Tetrathemis* Brauer with descriptions of three new African species (Odonata) . . .	137–142, 9 figs.
BOOK NOTICES	148

LONDON:

PUBLISHED BY THE SOCIETY AND

SOLD AT ITS ROOMS, 41, QUEEN'S GATE, S.W.7

Price 3s. 0d.

THE ROYAL ENTOMOLOGICAL SOCIETY OF LONDON

Founded, 1833. Incorporated by Royal Charter, 1885.

PATRON—HIS MAJESTY THE KING.

OFFICERS and COUNCIL for the SESSION, 1941-1942.

K. G. BLAIR, D.Sc., *President.*

PROF. P. A. BUXTON, M.A.
G. FOX-WILSON, N.D.H.
HUGH MAIN, B.Sc.
} *Vice-Presidents.*

BRIGADIER W. H. EVANS, C.S.I., C.I.E., D.S.O., *Treasurer.*

N. D. RILEY, *Secretary.*

F. J. GRIFFIN, A.L.A., *Registrar.*

Other Members of Council.

PROF. H. G. CHAMPION, C.I.E., M.A.
E. A. COCKAYNE, M.A., M.D., F.R.C.P.
A. S. CORBET, D.Sc., PH.D., F.I.C.
COL. F. A. LABOUCHERE.
A. M. MASSEE, D.Sc.
C. POTTER, B.Sc., PH.D.
O. W. RICHARDS, M.A., D.Sc.
THE HON. MIRIAM ROTHSCHILD.
J. SMART, B.Sc., PH.D.
W. H. T. TAMS.
A. WELTI.

Finance and House Committee.

A. WELTI (Chairman).

H. M. EDELSTEN.
A. G. GABRIEL.
C. N. HAWKINS.
FRANCIS HEMMING, C.M.G., C.B.E.
J. SMART, B.Sc., PH.D.

Publication Committee.

O. W. RICHARDS, M.A., D.Sc. (Chairman).

E. A. COCKAYNE, M.A., M.D., F.R.C.P.
G. FOX-WILSON.
A. M. MASSEE, D.Sc.
W. H. T. TAMS.
V. B. WIGGLESWORTH, M.A., B.CH., M.D., F.R.S.

Library Committee.

PROF. P. A. BUXTON, M.A. (Chairman).

E. B. BRITTON.
A. S. CORBET, D.Sc., PH.D., F.I.C.
B. M. HOBBY, M.A., D.PHIL.
F. LAING.
R. W. LLOYD.

Committee for the Protection of British Insects.

W. G. SHELDON (Chairman).

CAPT. E. BAGWELL-PUREFOY.
C. L. COLLENETTE.
W. J. DOW.
J. C. F. FRYER, O.B.E., M.A.
COL. F. A. LABOUCHERE.
N. D. RILEY.
H. M. EDELSTEN (Secretary).

The Executive Officers of the Society are *ex-officio* members of all Committees.

DELEGATES OF THE SOCIETY TO:

1. **British National Committee for Biology** (Royal Society).
   Sir Guy A. K. Marshall, C.M.G., D.Sc., F.R.S., appointed 1939.
   Dr. Karl Jordan, F.R.S., appointed 1936.
2. **Local Committee of Management of Wicken Fen.**
   Mr. H. M. Edelsten. *Mr. E. C. Bedwell.*
   [Delegates nominated by Committee for the Protection of British Insects.]
3. **National Trust for Places of Historic Interest or Natural Beauty.**
   Mr. W. G. Sheldon, appointed 1922.
4. **New Forest Association.**
   Mr. W. Fassnidge, appointed 1934.
5. **Royal Meteorological Society. Phenological Committee.**
   Dr. C. B. Williams, appointed 1937.

ON SOME *PONTANIA* SPECIES, WITH A REVISION OF THE *PROXIMA* AND *HERBACEAE* GROUPS (HYMENOPTERA SYMPHYTA)

By Robert B. Benson, M.A., F.R.E.S.

British Museum (Natural History).

(a) The *proxima* group.

I have lately found that adults of the bean-gall sawfly on *Salix fragilis* L. and *alba* L. have a longer ovipositor (sawsheath + oblong plate compared with hind tibia) than those on *Salix triandra* L. Because of differences in the biology and gall structure (see Carleton 1939) I have long suspected that some morphological differences would ultimately be found in the adults to distinguish these two forms as distinct species.

In an earlier paper (Benson 1940 (1)) the races on *Salix Caprea* L. and *atrocinerea* Brot. were separated as a distinct species for which the name *P. bridgmanii* (Cameron) was found to be available. At that time, not having access to the types of *Nematus proximus* Lepeletier, I arbitrarily selected the race on *S. fragilis* L. as the type race of the species, so that the race on *S. triandra* L. is the one that is now regarded as new.

The importance of having available long series of bred specimens, such as those given by Dr. Mary Carleton to the British Museum, is now clearly shown, leading, as it has, to the segregation of two previously unrecognised species. These three species, included under *P. proxima* (Lep.) (= *capreae* L. auctt.) in Enslin's monograph (1915 : 361–3), can be separated thus :—

1. Hind basitarsus scarcely as long as three following segments and the lateral hairs on the sawsheath set more outwards (Benson 1940 (1), figs. 5 and 3). [Galls on *Salix alba* L., *fragilis* L. and *triandra* L.] . . . . . 2.
–. Hind basitarsus longer than the three following segments and the lateral hairs on the sawsheath set more backwards (Benson 1940 (1), figs. 6 and 4). [Sawsheath scarcely as long as the two basal hind tarsal segments; ovipositor (sawsheath + oblong plate) about as long as the hind tibia. Galls oval and smooth, dark shining green, glabrous above, hairy beneath, halfway through leaf-blade of *Salix Caprea* L., *atrocinerea* Brot. and *aurita* L.] . . . . . *bridgmanii* Cameron.
2. Ovipositor (sawsheath + oblong plate) longer than hind tibia (1·1 : 1); sawsheath longer than two basal hind tarsal segments. [Galls rose-pink above and pink or yellowish-green beneath with the whole cuticle thrown into many uneven little ridges and protuberances, and set half-way through leaf-blade of *Salix fragilis* L. or *alba* L.] . . . . *proxima* Lepeletier.
–. Ovipositor shorter than hind tibia (0·9 : 1); sawsheath about as long as two basal hind tarsal segments. [Galls dark red above, pale yellowish-green beneath, with the whole cutical quite smooth, and set half-way through the leaf-blade of *Salix triandra* L.] . . . . . *triandrae* sp. n.

Pontania triandrae sp. n.

♀. Black with the following parts yellowish-white: palps, base of mandible, more or less front of clypeus, tegula, hind edge of pronotum, legs (except for the infuscate bases of the coxae, sometimes the extreme base of the hind femur, and more or less the hind tarsus); hind femur with a reddish tinge; apical sternites more or less piceous or yellowish. *Wings* hyaline; basal half of stigma white, apical half and venation brownish.

Length: 3 to 4·5 mm.

Punctation: upper parts and hind orbits of head, upper parts of thorax and, more sparsely, also the abdomen finely coriaceous and minutely rugulose, giving a dull surface; face with under parts of thorax and abdomen smooth and shining without punctures.

Head: with exposed part of labrum about half as long as broad; clypeus excised in front only to the extent of about one-third its total length; inner orbits beside the antennae prominent and in dorsal view subcarinate; frontal region raised above orbits but not clearly defined and without lateral sutures; frontal basin usually flat or only slightly concave but separated from the deep median fovea by the strong unbroken front wall of the frontal area; antenna about equal to a hind tibia with its tarsus in length; POL approximately equal to OOL. *Thorax* with hind tarsus shorter than tibia (0·8 : 1); hind basitarsus scarcely as long as the three following tarsal segments together. *Abdomen* with ovipositor (saw-sheath + oblong plate) a little shorter than hind tibia (0·9 : 1); sawsheath and genitalia not otherwise distinguished from those of *P. proxima* (Lep.) (Benson 1940, fig. 3).

♂ unknown.

England: N. Somerset, Bristol, 95 ♀♀ (including holotype), 1st brood 1937, bred by Dr. Mary Carleton (B.M. 1937–292) from galls in leaves of *Salix triandra* L.

(b) The *herbaceae* group.

Further critical study of the species related to *P. herbaceae* (Cameron) make it necessary to revise what I said about these species in an earlier paper (Benson 1935). The *herbaceae* group is characterised by the very short tibial spurs (on the hind legs the spurs are not longer than the apical breadth of the hind tibia in the female, fig. 1), the poorly defined frontal area of the head, the pale unicolorous yellow stigma in the female, and by the larvae living in sub-spherical galls (0·5–1·0 cm. in diameter) projecting almost equally above and below the leaf-blade of arctic willows.

This group of species was apparently unknown to Enslin (1912–1918 : 363) who, therefore, as was his wont, arbitrarily synonymised *Nematus herbaceae* Cameron 1875 with what he thought to be the commonest species in the genus—*Pontania capreae* (L.) auctt. (= *proxima* Lep.).

From the original description, *Nematus crassipes* C. G. Thomson 1871 must surely also belong to this group; from the fact that its hind tarsus is shorter than the tibia it cannot be either *P. herbaceae* (Cam.) or *polaris* Malaise, but it may well be one of the other species dealt with here. *Nematus crassispina* C. G. Thomson 1871 agrees in its description with paratypes of *Pontania reticulatae* Malaise 1920 presented to the British Museum; when my colleague Mr. J. F. Perkins was in Lund in 1938 he kindly examined Thomson's types of the former species for me and his notes appear to confirm this. Because the tibial spurs of *P. crassispina* (C. G. Thomson) and *reticulatae* Malaise (fig. 2) are longer than in the other species of the group (the inner hind tibial spur is longer than the apical breadth of the hind tibia) and because the gall of *P. reticulatae* Malaise projects only from the underside of the leaf of *Salix reticulata* L., I no longer regard them as belonging to the *herbaceae* group, but place them close to *P. collactanea* Förster (*Salix repens* L.) and *P. samolad* Malaise 1920 (*S. lapponum* L.) in the *viminalis* group.

These three species can be separated in the female on the proportions of the hind tarsus to the tibia as follows:—*P. collactanea* Förster 0·8 : 1; *P. reticulatae* Malaise 0·9 : 1; *P. samolad* Malaise 1 : 1.

The species in the *herbaceae* group form two subgroups according to the

arrangement of the lateral hairs on the sawsheath and to larval characters. Previously I (Benson 1935) regarded each of these subgroups as probably constituting a single species. Now I find that *P. polaris* Malaise 1920, *P. herbaceae* (Cameron) Malaise 1920 *nec* Cameron (and *P. reticulatae* Malaise 1920) can be distinguished from each other and from the similar species I found on the Scotch mountains in 1932 on adult morphological characters. This last is now described as new; the specimens were taken from catkins of *Salix herbacea* L., in Perthshire, but various other willows occurred nearby, including *S. lanata* L., *lapponum* L., *reticulata* L. etc.

In the *herbaceae* subgroup of *Pontania* a species attached to *Salix arbuscula* L. is described as new. In 1935 the species was not distinguished from *P. herbaceae* Cameron. Some of the specimens were captured from catkins of *S. arbuscula* L. on the crags above Lochan à Lairige, near Killin, Perthshire, in June 1932, while others were bred from galls gathered in August of the same year from the same plants by my colleague Dr. George Taylor.

P. lapponica Malaise 1920 (*Salix lapponum* L. in Lapland) almost certainly belongs also to the *herbaceae* subgroup, having, according to Malaise, regular rows of black dots on the sides of the larva as in *herbaceae* Cameron and *arbusculae* sp. n. but unlike species in the *polaris* subgroup. This species is probably very close to the new species on *S. arbuscula* L.; unfortunately I have not been able to compare specimens of the two but the larvae are apparently distinct (*cf.* fig. 3 and Malaise 1920 : fig. 13, p. 115).

In the following key to females of the *herbaceae* group of *Pontania*, those species known to occur in Britain are marked with an asterisk. The Lapland species *P. lapponica* Malaise 1920 (*Salix lapponum* L.) is omitted as I have seen no specimens of it and *P. reticulatae* Malaise 1920 (*S. reticulata* L.) is omitted as I do not, for the reasons stated above, any longer regard it as belonging to this group.

1. Longest hairs on the sides of the sawsheath (in dorsal aspect) strongly curved and set more outwards (so that if their bases were produced forwards until they met, the hairs on one side of the sheath would make an angle of approximately 90° with those on the other side, *cf.* Benson 1935 : fig. 5a, p. 27); hairs on apex of sawsheath clearly curved. [Larvae with lateral rows of black dots (see fig. 3 and Cameron, 1885 (2) : 206 and Malaise 1920 : fig. 13, p. 115)]. . . . . 2.

–. Longest hairs on the sides of the sawsheath only slightly curved and set more backwards (so that their produced bases would form an angle of much less than 90°, *cf.* Benson 1925 : fig. 6, p. 27); hairs on apex of sawsheath scarcely curved. [Larvae without lateral black markings (see Malaise 1920 : 111–112).] . . . . . 3.

2. Clypeus mostly infuscate and hind femora black except at the extreme apex; hind tarsus equal in length to hind tibia. [Galls on *Salix herbacea* L. in mountains of north Britain; larva, Cameron 1885 (2) : 206.]
**herbaceae* Cameron 1875.

–. Clypeus and hind femora mostly yellow except at extreme base; hind tarsus shorter than tibia (0·9 : 1). [Galls on *Salix arbuscula* L. in mountains of Scotland; larva, fig. 3.] . . . . . **arbusculae* sp. n.

3. Face and mesopleura shining and without punctures; hind tarsus equal in length to hind tibia. [Galls on *Salix polaris* L. and ?*herbacea* L. in Lapland.] . . . . . *polaris* Malaise 1920.

–. At least mesopleura dull with fine surface sculpture; hind tarsus shorter than hind tibia (0·8 or 0·9 : 1) . . . . . 4.

4. Clypeus black and shallowly emarginate (to the extent of less than ½ the total length of the clypeus); face smooth and shining; hind tarsus to tibia as 0·8 : 1. [Mountains of Scotland; food-plant unknown.] . . **algida* sp. n.
–. Clypeus mostly yellow and deeply excised in the middle (to the extent of at least ½ the total length of the clypeus); face dull with dense surface sculpture; hind tarsus to tibia as 0·9 : 1. [Galls on *Salix herbacea* L. and ?*polaris* L., in Lapland.] . .
aquilonis **nom. n.** (= *herbaceae* (Cam.) Malaise *nec* Cameron).

Pontania arbusculae sp. n.

♀. Black with the following parts yellow: mouth-parts, labrum, apex of clypeus, hind angle of pronotum, tegula, legs (except coxae and extreme bases of femora) 9th or 8th and 9th abdominal tergites and more or less the apical sternites and anal region. *Wings* hyaline; stigma and costa yellowish-white; rest of venation brownish. *Length* 4·5 mm.

Punctation: upper part of head and mesonotum with fine surface coriaceous punctures or finely rugulose; abdomen especially above transversely rugulose; face and mesopleura shining with very feeble scattered punctures. *Head* with exposed part of labrum about two-thirds as long as broad; clypeus very strongly excised in the middle of the front margin to a depth of about ½ its total length; inner orbits beside antennae projecting in front of the level of the eyes but not carinate; frontal area raised above orbits but not clearly defined and without lateral sutures; frontal basin only slightly concave and usually communicating with the small shallow median fovea by a notch in the middle of the front wall of the frontal area; antenna as long as a hind tibia together with its two basal tarsal segments; POL approximately equal to OOL. *Thorax* with hind tarsus shorter than tibia (0·9 : 1); hind basitarsus a little shorter than the three following tarsal segments together; hind tibial spurs curved almost equal in length, and shorter than the apical breadth of the hind tibia. *Abdomen* with ovipositor (sawsheath + oblong plate) shorter than the hind tibia (0·8 : 1); sawsheath from above appears narrow and blunt behind with the lateral hairs strongly curved and set well outwards from the sides of the sheath (so that if their bases were produced backwards until they met, the hairs on one side of the sheath would make an angle of almost 90° with those on the side, see Benson 1935 : fig. 5a, p. 27); saw not distinguished from that of *P. herbaceae* Cameron.

♂ as ♀ but darker in colour, the clypeus, tegulae, edges of pronotum, most of the femora, the apical tergites and more or less the base of the hypopygium being black; antenna as long as a hind basitarsus—twice as long as a hind tibia; genitalia as in *P. herbaceae* Cameron (see Benson 1935 : fig. 5b, p. 27).

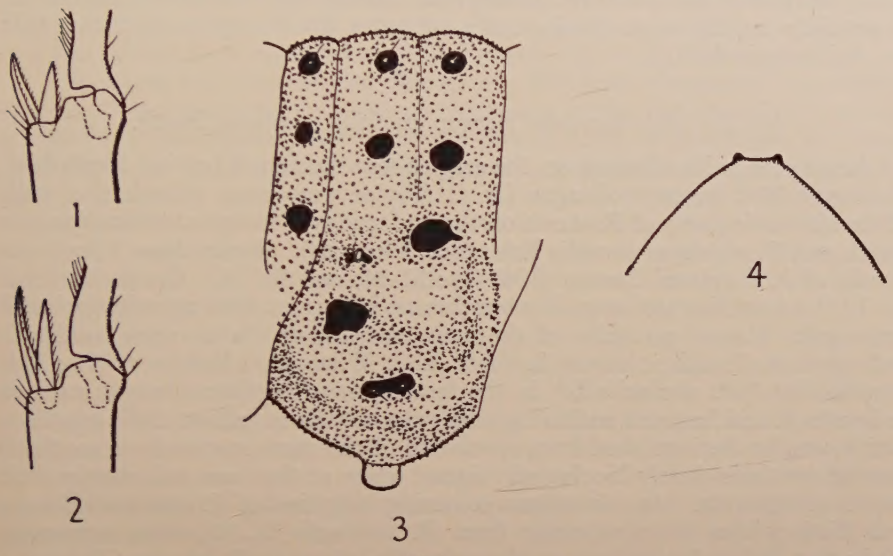
Scotland: Perthshire, crags above Lochan à Lairige near Killin, *c.* 2000 ft., 2 ♀♀ (including holotype), 2 ♂♂ (including allotype) bred v.1933 from galls collected from *Salix arbuscula* L. (Floderus det.) (*G. Taylor*), viii.1932; 1 ♀ collected from catkins of *S. arbuscula* L., vi.1932 (*R. B. Benson*).

Gall: on leaves of *Salix arbuscula* L. (det. Floderus); irregularly pea-shaped from about 1 cm. (♀) to 0·5 cm. (♂) in diameter, situated one side of the leaf-blade, which transects it, and adjoining or including the mid-vein.

Larva: up to about 0·7 mm. long. Head brown; body yellow, covered all over with minute black spicules which become obsolete on the tenth segment and with a pattern of large black warts as in fig. 3, on each segment except the tenth. Pseudocerci small, shorter than their basal breadth, and borne on a caudal protuberance as in fig. 4. Abdomen with feeble annulation to the segments and very small pseudopods; segment 3 with apparently only three annulets; setae confined to the dorsad and ventrad rows of warts. Thoracic legs with tibia shorter than femur.

PREPUPA : unicolorous slate-grey, without black spicules or spots; with setiferous head capsule, more prominent setiferous pleural lobes and much larger pseudopods.

This larva differs from that of *P. herbaceae* Cameron (Cameron 1885 (2) : 206) in that, among other things, there is no medial dorsal row of black spots. In the larva of *P. lapponica* Malaise (Malaise 1920 : fig. 13, p. 115), on the other hand, there are no large lateral spots, each of these being replaced by a small dot (on the first annulet) and by a group of two or more dots on the other annulets.



FIGS. 1 and 2.—Apical hind tibial spurs of adult female in *Pontania arbusculae* sp. n. (fig. 1) and *P. reticulatae* Malaise (fig. 2).
FIG. 3.—Lateral view of third abdominal segment of last instar larva of *Pontania arbusculae* sp. n.
FIG. 4.—Hind margin of tenth tergite of last instar larva of *Pontania arbusculae* sp. n.

Pontania algida sp. n.

♀ coloured as in *P. arbusculae* sp. n., but the clypeus and femora are entirely dark. *Length* 4·5 mm. *Punctation* as in *P. arbusculae* sp. n. but the upper part of the head is more shining and the mesopleura are lightly punctured in the middle.

In structure differs from *P. arbusculae* sp. n. in that the clypeus is not excised in the middle of the front margin but emarginate in front along its whole breadth and to a depth of less than ½ the total length of the clypeus; in that the frontal area is even less clearly defined; in that the hind tarsus is shorter compared to the hind tibia (0·8 : 1) and that the hairs on the sides of the sawsheath are much straighter and directed more backwards (the angle between the projected bases of the longest hairs being much less than 90°, see Benson 1935 : fig. 6, p. 27).

♂ unknown.

SCOTLAND : Perthshire, Breadalbane Mountains near Killin, over 2000 ft., 4 ♀♀ (including holotype) collected from catkins of *Salix herbacea* L., 7–14.vi.1932 (*R. B. Benson*).

(c) *Pontania apicifrons* Malaise 1931 (= *P. carinifrons* Benson 1940 **syn. n.**) and (*P. apicifrons* var. *punctifrons* Malaise 1931) = *P. anglica* (Cameron 1877) **syn. n.**

In a recent paper (Benson 1940 (2)) I separated two unrecognised British species related to *P. leucapsis* Tishbein. One of these, living as a larva in rolled leaf-margins of *Salix pentandra* L., I described as a new species—*P. carinifrons* Benson. In comparing specimens of this with a paratype of *P. apicifrons* Malaise 1931 (from Kamchatka, East Siberia) I find that the two are synonymous, but that *P. apicifrons* var. *punctifrons* Malaise 1931 (also from Kamchatka) is certainly not the same species but a synonym for *P. anglica* Cameron 1877 (on *Salix viminalis* L.).

(d) *Pontania harrisoni* Benson on *Salix nigricans* Smith.

Among the galls collected on the crags above Lochan à Lairige, Perthshire, in August 1932 by my colleague Dr. G. Taylor were some subspherical galls of the *viminalis* group of *Pontania* on the undersides of leaves of *Salix nigricans* Smith and *S. nigricans borealis* Fries (det. Floderus). From these I bred one female of *P. harrisoni* Benson (1940 (1) : 91–94, and fig. 8). On the banks of the Liddel near Newcastleton, Roxburghshire, in August 1940 my wife gathered some galls, almost certainly of the same species, on *Salix nigricans* Smith and *nigricans* Smith × *aurita* L. (det. A. J. Wilmott). Malaise (1920 : 114) records that " *P. viminalis* L." in the mountains of northern Sweden such as in Jemtland and Lapland, including a series he bred from galls on *Salix nigricans* Smith, can be distinguished from specimens of the same species from southern Sweden by their clearly bicoloured stigma, white at the base and clearly dark brown at the apex. As this stigma colouring is typical of *P. harrisoni* Benson and distinguishes it superficially from *P. viminalis* L., it seems extremely likely that Malaise's northern specimens really belong to *P. harrisoni* Benson.

The types of all the new species described above are in the British Museum (Natural History).

References.

Benson, R. B., 1935, The high mountain sawflies of Britain (Hymenoptera Symphyta). *Trans. R. ent. Soc. Lond.* **83** : 23–39, figs. 1–20b.

——, 1940 (1), Further sawflies of the genus *Pontania* Costa (Hym. Symphyta) in Britain. *Ent. mon. Mag.* **76** : 88–94, figs. 1–9.

——, 1940 (2), A new British leaf-rolling sawfly of the genus *Pontania* Costa on *Salix pentandra* L. (Hym. Symphyta). *Ent. mon. Mag.* **76** : 209–212, figs. 1–5.

Cameron, P., 1882–1892, *Monograph of British phytophagous Hymenoptera* **1–4.**

Carleton, M., 1939, The biology of *Pontania proxima* Lep., the bean gall sawfly of willows. *J. Linn. Soc. Lond.* (*Zool.*) **40** : 575–624, pls. 20–21, 11 figs.

Enslin, E., 1912–1918, Die Tenthredinoidea Mitteleuropas. *Deuts. ent. Z.* **1912–1917** (Beih.).

Malaise, R., 1920–1921, Beitrage zur Kenntnis schwedischen Blattwespen, 1. *Ent. Tidskr.* **41** : 97–128, 27 text-figs.

——, 1931, Entomologische Ergebnisse der schwedischen Kamtchatka Expedition 1920–1922, Tenthredinidae. *Ark. Zool.* **23** (A) (8) : 1–68, figs. 1–28.

Thomson, C. G., 1871, *Hymenoptera scandinaviae* **2.**

NOTES ON THE GENUS *TETRATHEMIS* BRAUER WITH DESCRIPTIONS OF THREE NEW AFRICAN SPECIES (ODONATA)

By Lt.-Col. F. C. Fraser, I.M.S. Retd., F.R.E.S.

Among the extensive collections of Odonata made in Uganda during the years 1927–28 by Professor G. Hale Carpenter, to whom I am greatly indebted for the opportunity of studying them, are no fewer than four species belonging to the genus *Tetrathemis* Brauer, only one of which was previously known to science. This is remarkable when one considers that the genus is but small and has always been regarded as almost purely oriental in distribution.

The genus was founded by Brauer in 1868 with *irregularis*, an oriental species, as the genotype. In the previous year, Selys had described a species *polleni* from Madagascar, under the new generic name of *Neophlebia* but owing to delay in the publication of this description, Brauer's name secured priority. Kirby, in 1890, in his Catalogue of Odonata, listed both names *Tetrathemis* and *Neophlebia*, but without giving his reasons for retaining the latter. In so far as I have been able to compare the oriental with the ethiopian fauna, I am quite unable to find any generic differences between the species, so that the name *Neophlebia* must be regarded as a pure synonym of *Tetrathemis*.

Subsequent to the description of the above two species, *T. irregularis leptoptera* Selys was described in 1869, *T. platyptera* Selys in 1878, *T. irregularis hyalina* Kirby in 1889, *T. flavescens* Kirby in 1889 and *T. yerburyi* Kirby in 1893, all these being oriental in distribution. Thus the genus justly came to be regarded as of oriental origin, and the single species from Madagascar as a recent extension into the ethiopian fauna. In the year 1899, however, Sjöstedt described a second African species, and systematists were confronted with the anomalous fact that its venation was more archaic in character than that of any of the oriental forms from which the ethiopian species had been considered to have originated! This new species, *camereunensis* Sjöstedt, unlike *polleni* from Madagascar, and all the oriental species of the genus, had its arculus occupying a very distal position between the 2nd and 3rd antenodal nervures instead of between the 1st and 2nd, the recent position which the arculus has attained to almost throughout the whole family Libellulidae.

Further species since added to the genus have served to strengthen this anomaly in one direction, whilst the ultimate preponderance attained by the ethiopian fauna has, of course, abolished it. *T. cladophila* Tillyard, 1906, from Australia, has the arculus in the recent position, *T. corduliformis* Longfield, 1936, from Africa, has it in the archaic position, and finally, of three new species from Africa described below, two have the arculus in the archaic, whilst the third has it in the recent position. The present position of the genus then is that the ethiopian forms preponderate over the oriental, and whilst all the latter are recent, the former, save for two transitional forms, are archaic in regard to the position of the arculus. In regard to the two transitional forms, it is perhaps more than a coincidence that they both possess anal appendages conforming to the recent conventional Libelluline type, whereas all the others have these abnormal or specialised, and, in one species, the inferior appendage has the apex markedly bifid, an archaic character only to be explained by a persistence of the ancestral zygopterous type. This interesting zygopterous character is found extremely rarely in the family Libellulidae and then only in the most archaic forms such as *Nannophlebia alexia* Lieftinck and a few

species of *Diplacina*; it does, however, crop up more commonly in some of the older Anisopterous families and more especially in the case of the GOMPHIDAE.

To sum up the present evidence, I think that it is quite clear that the genus *Tetrathemis* had its origin in Africa and spread eastwards via Madagascar, S. India and Ceylon to Malaysia, the Sondaic Archipelago, Australia and the Philippines. The most archaic forms are found in Africa, transitional forms in East Africa and Madagascar, and recent in S. Asia and Australia. Such a distribution lends support to Wegener's theory of floating continents but the invasion of N. Australia by the genus must have occurred within very recent times.

Key to African species of genus *Tetrathemis* Selys.

1. Arculus situated at the level of the 2nd or between the 2nd and 3rd antenodal nervures. (Archaic group) . . . . . 2.
–. Arculus situated at a level between the 1st and 2nd antenodal nervures. (Recent group) . . . . . 5.
2. Superior anal appendages of great length, about three times as long as segment 10, cylindrical and parallel, apices reflected outwards more or less . . . . . 3.
–. Superior anal appendages short or moderately short, only as long as or a little longer than segment 10, subcylindrical, apices obtuse and not reflected outwards . . . . . 4.
3. Inferior anal appendage deeply bifid at apex . . . . . *bifida* sp. n.
–. Inferior anal appendage obtuse and not bifid at apex *camereunensis* Sjös.
4. Superior anal appendages markedly longer than the inferior *corduliformis* Long.
–. Superior anal appendages shorter than the inferior . *ruwensoriensis* sp. n.
5. Wings of male, save for base and extreme apex, blackish-brown in colour; no yellow spots behind eyes . . . . . *polleni* Selys.
–. Wings of male hyaline, uncoloured; 2 sharply defined yellow spots behind the eyes . . . . . *carpenteri* sp. n.

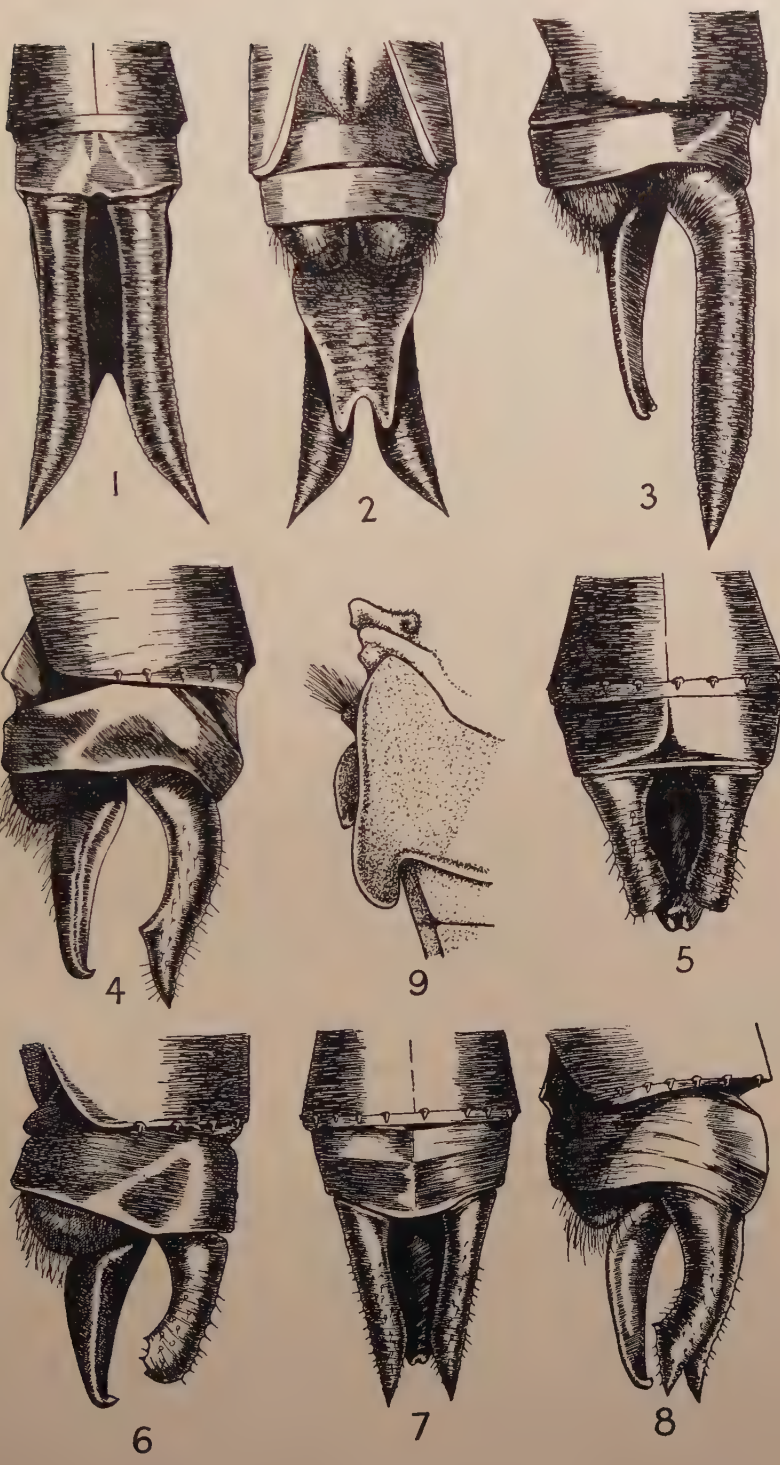
Tetrathemis bifida sp. n.

Male. Abdomen 21 mm. Hind-wing 21 mm.:—

Head: labium bright chrome yellow with the centre of middle lobe and the apposed borders of lateral lobes narrowly black; labrum glossy black, ante- and post-clypeus and the lower outer anterior corners of frons pale creamy yellow, rest of frons ochreous broadly capped with metallic blue-black; vesicle metallic blue-black; occiput ochreous to reddish-brown and bright chrome yellow behind. Eyes probably greenish during life (as in oriental species which I have taken alive), glossy black behind and without any yellow markings.

Prothorax warm reddish-brown, anterior lobe pale apple green bordered anteriorly with bright yellow; posterior lobe large, emarginate at centre, bordered with a ruff of long white hairs, bright apple green in colour. Thorax dark reddish-brown to dull black on dorsum with a fine line of apple green on each side of the middorsal carina which extends neither entirely above nor below. The centre of the alar sinus, the sides and a very irregular humeral stripe are also apple green in colour, the latter expanded below and with its upper end turned abruptly inwards towards the alar sinus. On the lower part of thorax the apple green changes to bright citron yellow, and on the sides, this is traversed by three oblique black stripes, the anterior and posterior of which are moderately broad, the

FIGS. 1–9.—1–3. Anal appendages of *Tetrathemis bifida* sp. n., seen in dorsal, ventral and left profile views respectively. 4. Anal appendages of *T. polleni* Selys, seen in left profile view. 5 and 6. Anal appendages of *T. ruwensoriensis* sp. n., seen in dorsal and left lateral views. 7 and 8. Anal appendages of *T. carpenteri* sp. n., seen in dorsal and left lateral views. 9. Genitalia of *T. carpenteri*, seen from the left side.


1
2
3
4
9
5
6
7
8

medial one narrow and incomplete below. Beneath thorax citron yellow traversed by three black stripes continuous with the lateral ones. Legs black, trochanters, coxae and inner sides of anterior femora yellow. Wings hyaline tinted palely with yellow or palely enfumed in old specimens. Pterostigma dark reddish-brown between black nervures, covering about 2 cells, 2·0 to 2·5 mm. long. Nodal index—$\frac{8-8}{8-7}\left|\frac{8-8}{7-8}\right.$, $\frac{7-9}{8-7}\left|\frac{9-7}{7-8}\right.$, hypertrigones traversed once in all wings, 4 to 6 cells in the anal loop, arculus lying between the 2nd and 3rd antenodals, less rarely opposite the 2nd.

Abdomen black marked with citron yellow as follows: segment 1 with a triangular spot on each side, segment 2 with the whole of sides and base, traversed obliquely by a narrow brown stripe on each side, segments 3 to 6 with reduced but similar lateral markings, which are reduced to a mere point on segment 6 and split up into apical and basal spots on segment 5; segment 7 with its basal two-thirds yellow but its middorsal carina and base finely black; remaining segments unmarked but the intersegmental joints yellow. Anal appendages black, superiors very long and straight, cylindrical, very acuminate at apex which turns slightly outwards but not to the extent seen in *T. camereunensis*. These appendages about three times as long as segment 10; the inferior appendage about three-fourths the length of superiors, deeply bifid at apex, the prongs of the bifurcation slightly divergent. Genitalia similar to that of *T. camereunensis*.

Female. Abdomen 20 mm. Hind-wing 27 mm.:—

A more robust insect than the male and with a correspondingly greater wing expanse. Venation of wings and colour and markings of body similar to the male but the markings of abdomen more extensive and those on segments 4 to 6 not differing markedly from those on segment 3. Anal appendages very shortly conical, black. Vulvar scale well developed, projecting analwards almost to apical border of segment 9.

Type in my collection.

Habitat:—Uganda: Bwamba Valley, near Kidongo, *c.* 2500 ft., 5 ♂♂ and 1 ♀ (*G. Hale Carpenter*), 7.i.28. This species closely resembles *T. camereunensis* Sjöstedt from West Africa, and is clearly closely related to it by the distal position of the arculus and the elongated cylindrical superior anal appendages. It is at once distinguished from this species by the bifid apex of the inferior appendage and the apices of the superiors only slightly turned outwards. It is a rare and interesting occurrence to find a bifid inferior appendage in a Libelluline; parallel cases are not uncommon in the archaic Gomphidae and less so in the Aeshnidae and Cordulegasteridae. The genus *Tetrathemis* stands right at the foot of the family Libellulidae and it is in just such a genus, possessing other archaic features in its venation, that one would expect such a feature as a bifid inferior appendage to crop up.

Tetrathemis carpenteri sp. n.

Male. Abdomen 19 mm. Hind-wing 25 mm.:—

Head: labium bright chrome yellow, middle lobe and borders of lateral lobes narrowly black; labrum glossy black, ante- and post-clypeus, as well as the lower part of frons, palest yellow, frons above and vesicle metallic blue-black; occiput reddish-brown above, bright chrome yellow behind; behind eyes glossy black *marked with two small sharply defined bright yellow spots*, one of which borders the eyes laterally. Prothorax reddish-brown, dorsum of anterior lobe, a transverse diffuse stripe on middle lobe and the whole of posterior lobe save its centre, apple green. The latter lobe large, rounded and with its border fringed with long white hairs. Thorax dull black on dorsum, the middorsal carina bordered on each side by a fine line of apple green which extends neither above nor below. The centre of the alar sinus and a very irregular humeral stripe, which expands below and is strongly angulated inwards above, are also apple green, changing below, however, to bright citron

yellow. Laterally apple green above changing to bright yellow below and marked by three oblique blackish-brown stripes, the medial one of which is incomplete in its lower third. Beneath thorax greenish-yellow traversed by two purplish-black stripes, the most posterior of which curls posteriorwards at each end to meet and enclose a spot of the ground-colour. Legs black, all coxae, trochanters and the inner sides of anterior femora bright yellow. Wings hyaline. Pterostigma blackish-brown between black nervures, 2·75 to 3·0 mm. in length; nodal index—$\frac{7-9}{7-7}\Big|\frac{9-7}{7-7}$; hypertrigones traversed once in the fore-wings only; 4 cells in anal loop; arculus lying between the 1st and 2nd antenodal nervures. Abdomen black marked with bright greenish-yellow as follows: a small triangular spot on each side of segment 1; 2 spots on each side of segment 2 narrowly separated by the black jugal suture; similar spots, but larger, on segments 3 and 4, small baso-lateral spots on segments 5 and 6 and a large basal spot on segment 7 which is bordered basally and bisected narrowly by black; remaining segments unmarked. Anal appendages black, very simple and of typical Libelluline shape. Superiors about twice the length of segment 10, cylindrical, curving gently downwards and ending in a finely tapered point. In profile a small ventral subapical spine is present. Inferior appendage triangular, of the same length as superiors, its apex curled evenly upwards and minutely emarginate. Genitalia very similar to that of *T. camereunensis* but the lobe smaller and bent at right angles to the posterior border of the segment.

Habitat :—British East Africa: Uganda, Entebbe, 1 ♂ (*G. Hale Carpenter*), vii.1927, the type, now in my collection. This species is distinguished by the conventional Libelluline type of its anal appendages, which are closely similar to those of *T. polleni* Selys in this respect, but the latter has the wings broadly coloured blackish-brown. The genitalia of this new species also offer specific characters by the shape and angulation of the lobe. Lastly the isolated, sharply defined yellow spots behind the eyes are extremely characteristic of this species.

Tetrathemis ruwensoriensis sp. n.

Male. Abdomen 18 mm. Hind-wing 23 mm. :—

Head: labium chrome yellow with middle lobe and the borders of lateral lobes narrowly black; labium glossy black; ante- and post-clypeus and lower part of frons pale citron yellow; frons and vesicle metallic blue-black; eyes probably green during life, glossy black behind and without any yellow spots as in the last described species; occiput reddish-brown. Prothorax dark blackish-brown, the posterior lobe apple green with a quadrate spot of dark reddish-brown at its centre, large, rounded, minutely emarginate at its centre, fringed with long whitish hairs. Thorax velvety black on dorsum, bright apple green laterally changing to citron yellow low down on the sides. A fine line on each side of the middorsal carina, extending whole length of thorax, apple green; the centre of alar sinus and a very irregularly shaped humeral stripe also apple green. The sides traversed by three steely black stripes, the medial one of which is incomplete below. Beneath citron yellow traversed by two narrow black stripes. Legs black, coxae, trochanters and the anterior femora on the inner side yellow. Wings hyaline; pterostigma blackish-brown between thick black nervures, 2·0 to 2·25 mm. in length; nodal index—$\frac{8-8}{8-7}\Big|\frac{9-7}{7-7}$; hypertrigones traversed once in all wings; anal loop with 4 cells; arculus situated between the 2nd and 3rd antenodal nervures or opposite the 2nd. Abdomen black marked with citron yellow as follows: segment 1 with a small ventro-lateral spot on each side; segment 2 with its sides broadly and its base narrowly yellow, this colour laterally traversed by an oblique black stripe from ventro-apical border to dorso-basal; segments 3 to 6 with oblique lateral stripes converging basally, these stripes becoming more and more restricted from

segment to segment; segment 7 with rather more than its basal half yellow but the mid-dorsal carina finely black; remaining segments unmarked. Anal appendages black, superiors nearly twice the length of segment 10, broad, subcylindrical, very obtuse at apex which is furnished apically with several robust small teeth along the outer ventral border. Inferior appendage markedly longer than superiors, triangular, tapered to apex which ends in an upturned point minutely and narrowly emarginate. Genitalia closely similar to that of *T. corduliformis* Longfield but the lamina not emarginate and the hamules but very slightly turned outwards. Female unknown.

Habitat :—Uganda : Ruwenzori Mts. (*G. Hale Carpenter*), 1 ♂, the type, now in my collection, 1927. This species is closely similar to *T. corduliformis*, especially in regard to its clubbed-shaped abdomen and genitalia. It differs in the following respects : the superior anal appendages markedly shorter than the inferior, the reverse being the case in *corduliformis*. The author has failed to describe the appendages of this latter species but Mr. Kimmins' figure may be relied upon to demonstrate this character. The apex of the inferior appendage is acuminate and minutely emarginate, but very obtuse in *corduliformis*. This latter species is pruinosed in part, but there is no sign of this in *ruwensoriensis* although the type is fully adult. The ratio of the length of abdomen to wing is about 6 to 8 in *ruwensoriensis*, but more nearly equal in *corduliformis*; lastly the nodal index of fore-wing in *ruwensoriensis* is higher than in *corduliformis*. Of all these differences, that of the shape of the anal appendages will at once suffice to distinguish the two species.

DESCRIPTION OF NEW STAPHYLINIDAE (COLEOPT.)—3

By Malcolm Cameron, M.B., R.N., F.R.E.S.

Olophrum kashmiricum sp. n.

Shining, head black; thorax dark brown; the margins narrowly reddish-yellow; elytra blackish-brown, the shoulders, lateral and posterior margins reddish-yellow. Abdomen pitchy, the sides and apex brownish-yellow. Antennae black, the first five segments and legs reddish-yellow. Length 3·75 mm.

In build somewhat like *puncticolle* Epp. but more depressed, smaller and narrower with the sides of the thorax straighter behind. Head impunctate in front, elsewhere with some moderate scattered punctures; ground-sculpture absent. Antennae with the 3rd segment a little longer than the 2nd, 4th to 7th a little longer than broad, decreasing in length, 8th to 10th about as long as broad. Thorax transverse (3·3 : 2), convex, the sides rounded in front, retracted and straighter behind, moderately coarsely and moderately closely punctured; ground-sculpture absent. Elytra fully twice as long as the thorax, a little widened behind, a little more coarsely punctured; ground-sculpture absent. Abdomen feebly coriaceous, the 1st visible tergite very finely and moderately closely punctured, almost impunctate elsewhere.

Kashmir : Gulmarg. Type in my collection.

Olophrum kashmiricum parvum subsp. n.

Differs in the smaller size (3 mm.), narrower build and brighter colour, the thorax is bright reddish-yellow, the elytra yellow, sometimes with the disc extensively infuscate, the abdomen brownish-yellow with lighter sides and apex.

Kashmir : Gulmarg. Types in my collection.

Amphichroum altivagans sp. n.

Moderately shining, fore parts reddish-yellow, abdomen black. Antennae black, the first three segments and legs reddish-yellow. Palpi reddish-yellow, the last segment infuscate. Length 2·5 mm. Build of *monticola* Cam. but smaller and more brightly coloured, the antennae similarly constructed; the head is more strongly coriaceous, less shining and with fewer and more obsolete punctures, the punctures of the thorax are a little larger, not quite so close and more superficial and a fine ground-sculpture is also present, the elytra are a little less coarsely punctured. Abdomen very finely and sparingly punctured, feebly coriaceous.

♂. Middle tibiae thickened and excavated internally for the apical two-thirds, the excavated margin closely and finely denticulate.

KASHMIR: Khelanmarg, altitude 10,000 feet. Type in my collection.

Lesteva brevipennis sp. n.

Moderately shining; head and abdomen black, the rest pitchy black to pitchy brown. Antennae blackish, the first two segments and sometimes the last, yellowish-red. Legs reddish or reddish-yellow, the tibiae sometimes infuscate. Length 3·5–3·75 mm. Resembles *fluviata* Champ. in the build of the head and thorax but the puncturation of both is a little coarser, the antennae stouter, the penultimate segments a little shorter and at once distinguished by the much shorter elytra which are widened behind and only twice as long as the thorax and more finely and rather less closely punctured.

KASHMIR: Gulmarg, altitude 8000 feet. Type in my collection.

Geodromicus ruficornis sp. n.

Rather shining, black. Antennae yellowish-red. Legs yellowish-red, the femora sometimes infuscate. Length 5 mm.

Except for the shorter elytra and smaller eyes scarcely differing from *nigrita* Müll. in build, colour and lustre but the head is a little narrower, the ocelli nearer to each other than to the eye, the impressions and sculpture scarcely differing and the antennae similarly constructed. Thorax transverse (3 : 2·75), formed as in *nigrita*, narrowly impressed along the middle, the impression not extending to the anterior or posterior borders, before the scutellum with a fovea, the puncturation scarcely as close and distinctly less coarse than in that species. Elytra longer than the thorax (5·75 : 2·75), widened behind, more coarsely and deeply punctured than in *nigrita*, the abdomen as in that species.

KASHMIR: Gulmarg, Lianmarg, altitude 8000–10,000 feet. Type in my collection.

Geodromicus depressus sp. n.

Moderately shining, black. Antennae black, the first segment pitchy. Legs pitchy-black, the tarsi reddish-yellow. Length 6·75 mm.

A broad depressed species widest a little behind the middle, much resembling in build *Hygrogoeus cyanipennis* Cam. Head narrower than the thorax, the eye about as long as the temple, deeply triangularly impressed between the antennal tubercles, more superficially on the vertex, closely, moderately finely punctured, coriaceous. Ocelli absent. Antennae very long and slender. Thorax transverse (5·75 : 4·3), the sides rounded and rather strongly dilated in front, feebly arcuately retracted behind, before the scutellum

sometimes with a small obsolete impression, in front of it with a fine smooth short impunctate line, on each side of it broadly and obsoletely impressed, closely but more coarsely punctured than the head and without ground-sculpture. Elytra twice as long as the thorax, strongly widened behind and with very similar sculpture. Abdomen finely and very closely punctured. This and the two following species have a facies recalling *Cimex lectularius* L.

KASHMIR : Gulmarg. Type in my collection.

Geodromicus cimicoides sp. n.

Very similar to *depressus* Cam. but differing in the following respects : the head is a little narrower, the thorax less transverse (5 : 3·4), the sides much less dilated in front and straightly retracted behind, the disc with four obsolete impressions like those found in some species of *Trogophloeus*, the smooth median line not interrupted but extending from the median basal impression nearly to the anterior border, the puncturation scarcely differs; the elytra are shorter, less than twice as long as the thorax (7 : 4) and a little more coarsely punctured. In other respects similar. Length 6 mm.

KASHMIR : Gulmarg. Type in my collection.

Geodromicus (s.str.) **perplexus** sp. n.

Intermediate between *coriaceus* Cam. and *depressus* Cam., the head narrower than in *depressus* but otherwise similar, thorax less transverse than in the latter (4·5 : 3·3) but otherwise similar in build, more transverse than in the former; before the scutellum with a feeble impression and a short impunctate line in front of it, the puncturation as in *coriaceus* and with similar ground-sculpture; elytra twice as long as the thorax, widened behind, the puncturation less fine than in *depressus* and resembling that of *coriaceus*. The unique specimen is of a yellowish-brown colour and is apparently immature. Length 5 mm.

KASHMIR : Lobzang (Hauser). Type in my collection.

Geodromicus subsimilis sp. n.

Very like *curvipes* Cam. but less shining, the thorax as long as broad, its puncturation and that of the head a little finer and closer and with a fine ground-sculpture not present in *curvipes* : elytra longer than the thorax (7 : 5), slightly widened behind, more finely and more superficially punctured than in that species, the antennae a little longer. In other respects (including the curved anterior tibiae in the ♂) similar. Length 5–7 mm.

Ghum district : Mangpu; Tiger Hill, 8000–10,000 feet. Type in my collection.

Hygrogoeus armatus sp. n.

Moderately shining, black. Antennae and palpi black. Legs pitchy, tarsi reddish. Length 7·5–8·0 mm. In build, colour and lustre much resembling *kumaonensis* Champ. but larger, the antennae longer and more slender, the thorax more deeply and closely punctured, less coriaceous. Head (♂ and ♀) narrower than the thorax, the eyes prominent, shorter than the rounded and somewhat dilated postocular region, triangularly impressed behind the anterior margin, the vertex deeply and broadly impressed, the ocelli nearer to each other than to the eye, moderately finely, closely punctured, finely coriaceous. Antennae very long and slender, all the segments much longer than broad, the 11th longer

than the 10th. Thorax in ♂ very slightly transverse (4·5 : 4·3), in the ♀ more transverse (4·75 : 4), the sides feebly rounded in front, straightly retracted behind, the posterior angles rounded, sulcate along the middle, the sulcus broader and extending more forwards in the ♀, moderately finely, closely punctured, finely coriaceous. Elytra nearly twice as long as the thorax in the ♂, twice as long in the ♀, widened behind, more coarsely punctured. Abdomen coriaceous, impunctate.

♂. Posterior tibiae furnished with a strong sharp tooth at the middle of the inner margin.

KASHMIR : Aphar Wat, altitude 13,000 feet. Type in my collection.

Coprophilus (s.str.) **kashmiricus** sp. n.

Fore-parts very shining black, the elytra posteriorly narrowly and obscurely reddish-yellow. Abdomen black with silky lustre. Antennae black. Legs reddish-yellow, the tibiae infuscate. Length 4·5 mm. Narrower than *marginalis* Reitt. and differently coloured, thorax shorter, more sparingly punctured, the sides very obscurely crenulate. Head narrower than the thorax, with transverse sulcus posteriorly, with a few small punctures and without ground-sculpture. Antennae a little thickened towards apex, the 2nd and 3rd segments of equal length, 4th to 6th globose, 7th to 10th gradually more transverse, the penultimate about a half broader than long. Thorax transverse (3 : 2·5), trapezoidal, the sides feebly rounded in front, straight and retracted behind, scarcely perceptibly crenulate, before the scutellum with two little impressions separated by a short keel, the punctures a little larger and closer than on the head; ground-sculpture absent. Elytra a little longer and broader than the thorax, with coarsely punctured striae. Abdomen slightly widened behind, impunctate, coriaceous and sericeous.

KASHMIR : Gulmarg. Type unique, in my collection.

Coprophilus (**Zonoptilus**) **longicollis** sp. n.

Black, the fore-parts very shining and without ground-sculpture, the abdomen with sericeous lustre. Antennae black. Legs pitchy, the tarsi reddish-yellow. Length 5 mm.

A cylindrical convex species. Head narrower than the thorax, the temples about as long as the eyes, front bi-impressed, posteriorly with transverse sulcus before the neck, moderately finely punctured, the punctures rather close behind the sulcus and at the sides, more sparing elsewhere. Antennae a little thickened towards apex, the 2nd and 3rd segments of equal length, 4th and 5th as long as broad, 6th to 10th gradually more transverse, the penultimate about a half broader than long. Thorax slightly longer than broad, regularly oval, widest at the middle, the anterior border broadly and feebly emarginate, the posterior rounded, before the scutellum with two little impressions separated by a short ridge, the puncturation moderately fine and rather close. Elytra as long and slightly broader than the thorax, parallel, with a sutural and five other punctured striae not reaching the posterior margin, the interstriae impunctate, posteriorly with a few scattered punctures. Abdomen widened towards the apex, practically impunctate, coriaceous with sericeous lustre.

Darjeeling district : Ghum. Type unique, in my collection.

Ancyrophorus (s.str.) **kashmiricus** sp. n.

Near *omalinus* Er. but the antennae with the penultimate segments slightly transverse, the legs darker, the femora and tibiae in great part blackish, head narrower, more finely

punctured, the ground-sculpture weaker, the eyes smaller; thorax narrower, a little broader than long (2·3 : 2), slightly constricted behind, a little more finely and a little more closely punctured, the ground-sculpture less distinct, the impressions usually well marked, but sometimes with the anterior pair more obsolete; elytra a little shorter (3·5 : 2) than in *omalinus*, as closely but more finely punctured; abdomen as in that species. Less shining than *nitidus* Cam. with more finely and more closely punctured head and stronger ground-sculpture, longer, narrower, more closely punctured thorax with stronger ground-sculpture and much more finely punctured elytra. Length 3·5 mm.

Kashmir: Gulmarg. Type in my collection.

Ancyrophorus (s.str.) **basicornis** sp. n.

Moderately shining, black. Antennae black, the first two segments and legs reddish-yellow. Length 4 mm. Except for the much shorter elytra resembles *omalinus* Er. in build, but with shorter stouter antennae, the intermediate segments shorter, the penultimate about as long as broad, eyes smaller, punctures of head more numerous and closer, the ground-sculpture much less evident, thorax scarcely differing in build from *omalinus*, slightly transverse (2·5 : 2), much more closely and more deeply punctured than in that species but with similar ground-sculpture, elytra shorter, half as long again as the thorax, as closely but more coarsely punctured than in *omalinus*.

Darjeeling district: Ghum. Type in my collection.

Ancyrophorus (s.str.) **proximus** sp. n.

In build differing but little from *omalinus* Er. but blacker, the antennae black and a little stouter, the penultimate segments slightly transverse, the tibiae black, head a little broader, the eyes larger, more finely and more closely punctured, the ground-sculpture less marked; thorax less finely and more closely punctured, the ground-sculpture similar. Elytra longer than the thorax (3·5 : 2), the puncturation much as in *omalinus*. From *basicornis* Cam. it differs in the colour of the antennae and legs, the broader head with much larger eyes and rather closer puncturation, the penultimate segments of the antennae as long as broad as in that species; thorax rather less shining, the ground-sculpture more distinct; elytra longer, nearly twice as long as the thorax, the puncturation a little finer than in *basicornis*.

Darjeeling district: Ghum. Type in my collection.

Ancyrophorus (s.str.) **nigerrimus** sp. n.

Moderately shining, deep black. Antennae black, femora and tarsi brownish-yellow, the tibiae black. Length 4·3–4·75 mm.

In build very like *monticola* Cam. but blacker, less shining, the legs dark, the antennae a little thinner and longer, the penultimate segments a little longer than broad, the head a little more finely and more closely punctured, the thorax shorter and so more transverse (5·5 : 4), the sculpture scarcely differing; elytra twice as long as the thorax, the puncturation equally close but a little finer than in *monticola*.

Darjeeling district: Ghum. Type in my collection.

Trogophloeus (Carpalimus) ripicola sp. n.

In build and colour differing but little from *arcuatus* Steph. but much less shining and with longer pubescence, the head a little narrower, the eyes smaller, the puncturation and antennal structure scarcely differing, thorax formed as in *arcuatus* but with the median impression in front deeper, the puncturation finer and closer on the disc but equally coarse at the sides, the elytra as closely but a little more finely punctured than in *arcuatus*, the abdomen as in that species; the whole insect covered with a long, more or less erect greyish pubescence. Length 3–3·5 mm.

Darjeeling district: Ghum. Type in my collection.

Apocellagria amplipennis sp. n.

Head black, rather dull, the rest more shining, the thorax pitchy black, elytra and abdomen yellowish-brown. Antennae black. Legs reddish-yellow, the tibiae a little infuscate. Length 3·5 mm.

Head narrower than the thorax, closely moderately coarsely punctured, the eye longer than the post-ocular region. Antennae with the 4th to 9th segments longer than broad, decreasing in length, the 10th about as long as broad, 11th oval, pointed, slightly longer than the 10th. Thorax slightly transverse, strongly cordiform with deep crescentic sulcus at the base, on each side of the middle with a broad and deep sulcus, in the middle in front with an oval impression, at the middle of the sides also impressed, more finely and less closely punctured than the head. Elytra much longer (7 : 4) and much broader than the thorax, very slightly broader than long, slightly wider behind, uneven, closely and moderately finely punctured. Abdomen strongly narrowed towards the apex, the first four visible tergites with a little keel at the middle of the base of each, closely and moderately finely punctured at the bases, more finely elsewhere. Head and thorax with long erect hairs, elytra and abdomen with shorter, more depressed pubescence.

Darjeeling: Ghum, Rongdong Valley. Type in my collection.

An additional character in *Apocellagria* is that the first two or three sternites are constricted at the bases. In facies it is very like *Trogactus* Sharp. *Trogophloeus assamensis* and *pubicollis* Cam. 1930, *Faun. Brit. Ind. Staph.* **1**: 181, 182 must be removed to *Apocellagria*.

Book Notice.

Embryology of Insects and Myriapods. The developmental history of insects, centipedes, and millepedes from egg desposition [sic] *to hatching.* By O. A. Johannsen and F. H. Butt. 8vo. London (McGraw-Hill Publishing Co., Ltd.), 1941. Price 35*s.* pp. xi + 462, 370 figs.

This volume forms another of the well-known series "McGraw-Hill Publications in the Zoological Sciences." The work is the result of 20 years of lectures on the embryology of insects by the senior author, a course now being continued by the junior author, in Cornell University.

The list of Chapters is: Introduction; a type of embryonic development in insects; the egg fertilisation, maturation, and cleavage; early development; embryonic envelopes, dorsal organs, and blastokinesis; gastrulation, formation of the germ layers, and development of the entoderm; the alimentary canal; ectodermal derivatives; mesodermal derivatives; polyembryony and parthenogenesis; microorganisms in the egg; experimental embryology. Part II, Oligoentomata and Aptilota; Ephemerida, &c.; Orthopteroidea; Oligonephridia; Neuroptera and Coleoptera; Hymenoptera; Trichoptera and Lepidoptera; Siphonaptera and Diptera; Myriapoda. There is an extensive Bibliography of 37 pages and an index.

As may be seen, the first part of the book is introductory and general in its scope and the second part is devoted to special chapters on the various orders.

It is perhaps natural that the authors have found it necessary for the scope of the book to be restricted to a detailed study of one or two species in each of the orders dealt with. This has enabled full treatment to be given to each of these species and resulted in a generalised picture for each order. Allowance is made for this by giving details of representatives of the several main divisions where the embryology is not uniform throughout an order.

Book Notice.

Plant Galls and Gall makers. By E. P. Felt. pp. viii + 364, 41 pls., 344 figs. 8vo. Ithaca, N.Y. (Comstock Publishing Co.), 1940. Price $4.

This work is divided in two parts: (i) Introduction and (ii) Key to the Galls of the various plant families. It "is planned to give a general idea of the immensely interesting and comparatively unknown insect galls and their producers and to facilitate the identification of the hundreds of these deformities occurring upon numerous plants in all parts of North America."

It is a revised edition of the "Key to American Insect Galls" published by the author in 1917, and many of the figures are reproduced from that work. The book is arranged by plant families as a means to easier determination of the gall and its maker. The galls of the oak tree are dealt with on pages 80 to 228, which is something approaching one-half of the book.

The illustrations are of the galls either *in situ* or in section. The gall insects are not figured.

PUBLICATIONS

The Publications of the Royal Entomological Society are *Transactions* and *Proceedings*.

The *Transactions* form an annual volume, each paper in the volume being issued as a separate part. The parts are issued irregularly throughout the year.

The *Proceedings* are issued in three series:

Series A. General Entomology
Series B. Taxonomy
Series C. Journal of Meetings

Series A and B are issued in twelve parts, forming an annual volume of approximately 240 pages.

The following information is supplied for the guidance of authors wishing to submit papers for publication in any of the Society's journals.

INTRODUCTORY

The Society is prepared to undertake the provision of a reasonable number of text figures. The original drawings for such figures must be supplied by authors. Such drawings or groups of drawings must be drawn to a scale which will permit of their reduction to an area of dimensions not exceeding $7\frac{1}{2} \times 4\frac{3}{4}''$. In the case of the *Proceedings Series A* and *Series B*, authors are required to pay for the necessary blocks for the provision of plates, half-tone and coloured work.

A uniform method is adopted for the citation of bibliographical references in the Society's publications as follows:

Smith, A., 1936, New species of Coccidae, *Proc. R. ent. Soc. Lond.* (B) **6** : 301–306, pl. 1.

——. 1936, New species of Coccidae, *Trans. R. ent. Soc. Lond.* **84** : 901–936.

Titles of periodicals cited are to be abbreviated in the manner indicated in the *World List of Scientific Periodicals, 2nd edition*, 1934.

Authors are entitled to receive 25 copies of their papers free of charge and may purchase additional copies provided that request be made before publication.

Papers offered for publication should be sent to the Secretary, Royal Entomological Society of London, at *41, Queen's Gate, London, S.W.7*, and must be typewritten on one side of the paper only. Sufficient space must also be left between the lines for editorial corrections.

The copyright of the Society's publications is vested in the Society.

TRANSACTIONS

Papers offered for publication in the *Transactions* are considered by the Publication Committee of the Society, which meets usually in the months of May and November. In order that papers may be considered at these meetings it is necessary for the manuscript and drawings for any illustrations to be in the hands of the Secretary fourteen days before the meeting of the Committee.

Papers of less than eight printed pages (approximately 7000 words) will not normally be accepted for the *Transactions*, and papers by authors who are not Fellows of the Society must be communicated by a Fellow.

PROCEEDINGS SERIES A AND SERIES B

Papers submitted for publication in either *Series A* or *Series B* of the *Proceedings* by authors who are not Fellows of the Society may be accepted if they are communicated by a Fellow. Preference will be given to papers written in the English language, and papers of more than eight printed pages (7000 words) will not normally be accepted for publication in these journals.

PROCEEDINGS SERIES C

Series C is issued prior to every General Meeting. It contains abstracts of exhibits to be shown and communications to be made, together with the titles of papers accepted for publication.

The annual subscription to *Series A. General Entomology* is *£1 4s. od.; Series B. Taxonomy, £1 4s. od.* (single parts *3s. od.*); and *Series C. Journals of Meetings, 6s. od.*

As from January 1936 the journal *Stylops* is continued as *Proceedings Series B. Taxonomy*. Copies of volumes 1–4 are available at *£1 16s. od.* each, post free.

MEETINGS

TO BE HELD IN THE SOCIETY'S ROOMS

41, Queen's Gate, S.W.7

1941.

WEDNESDAY, October 1
" November 5
" December 3

1942.

" January 21 (ANNUAL MEETING)
" February 4

THE ROYAL ENTOMOLOGICAL SOCIETY OF LONDON

The Fellowship and Fees

Fellows pay an Admission Fee of £3 3*s*. The Annual Contribution of £2 2*s*. is due on the first day of January in each year, and is payable in advance. Fellows under the age of 25 years may pay the entrance fee in three equal annual instalments.

Fees should be paid to the Treasurer, at 41, Queen's Gate, S.W.7, and *not to the Secretary*.

Fellows desiring to pay their Annual Contribution through their bankers may obtain an official form of banker's order by applying to the Treasurer.

Fellows whose Contributions for the current year have been paid are entitled to receive the *Transactions* and *Proceedings* of the Society free of charge. Further copies may be purchased at reduced prices by applying to the Registrar.

Forms of application for Fellowship, copies of the Bye-Laws and the List of Fellows may be obtained from the Registrar.

Meetings and Exhibitions

Fellows and others wishing to make a communication to a General Meeting of the Society are requested to send in their names, the title of their exhibit, and a short abstract of their remarks, to the Registrar fourteen days before the meeting at which it is proposed to make the communication. Should it be desirable to publish a fuller account of the communication the manuscript may be submitted for publication in *Proceedings Series A* or *Series B*. If the epidiascope is required, 24 hours' notice must be given. Objects for projection should not exceed 6 ins. by 6 ins.

Fellows resident abroad, or otherwise unable to attend meetings, are reminded that notes or observations sent to the Secretary may be communicated to a General Meeting on their behalf.

PRINTED FOR THE SOCIETY BY RICHARD CLAY AND COMPANY, LTD.,
BUNGAY, SUFFOLK.